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WHAT IS CLAIMED IS:

- 1. A method for purifying viruses from solution, the method comprising:
- 2 (a) combining the solution with an anionic polyelectrolyte;
- 3 (b) combining the solution with a cationic polyelectrolyte; and
- 4 (c) centrifuging the solution to obtain a supernatant and a pellet, wherein the pellet comprises the virus.
- 1 2. The method of claim 1, wherein the anionic polyelectrolyte is selected from the group

consisting of glycosaminoglycans and polysaccharides.

- The method of claim 2, wherein the glycosaminoglycans and polysaccharides are sulfated.
- 4. The method of claim 1, wherein the anionic polyelectrolyte is selected from the group consisting of chondroitin sulfates, heparin, heparan sulfate, keratan sulfate, carrageenans, fucoidan, poly-L-glutamic acid, poly-L-aspartic acid, poly(glycolic acid), poly(lactic acid), and poly(lactic-co-glycolic acid).
- 5. The method of claim 4, wherein the anionic polyelectrolyte is chondroitan sulfate C.
- 6. The method of claim 1, wherein the cationic polyelectrolyte is a cationic polymer that complexes with the anionic polyelectrolyte.
- 7. The method of claim 1, wherein the cationic polyelectrolyte is selected from the group consisting of (diethylamino)ethyl dextran, histones, protamine, poly-L-arginine, poly-L-histidine, and poly-L-lysine.
- 1 8. The method of claim 1, wherein the cationic polyelectrolyte is hexadimethrine bromide.
- 9. The method of claim 1, wherein the solution further comprises proteoglycans.

- 10. The method of claim 1, further comprising separating the pellet from the supernatant, and 1 then resuspending the pellet in a resuspension buffer. 2
- 11. The method of claim 10, wherein the volume of the resuspension buffer is no greater than 1 one-tenth the volume of the solution, thereby resulting in at least a ten-fold concentration 2 of the virus. 3
- 12. The method of claim 10, wherein the volume of the resuspension buffer is no greater than 1 one-hundredth the volume of the solution, thereby resulting in at least a one-hundred-fold 2 concentration of the virus. 3
- 13. The method of claim 10, wherein the resuspension buffer comprises phosphate-buffered 1 saline. 2
- 14. The method of claim 10, wherein the resuspension buffer comprises cell culture medium. 1
- 15. The method of claim 10, wherein the resuspension buffer comprises a pharmaceutically 1 acceptable carrier. 2
- 16. The method of claim X, wherein the virus is a retrovirus. 1
- 17. The method of claim 1, wherein the virus is an enveloped virus. 1
- 18. The method of claim 16 wherein the virus is selected from the group consisting of human 1 immunodeficiency virus, lentiviruses, Moloney murine leukemia virus, herpes simplex 2 virus, Epstein-Barr virus, human cytomegalovirus, influenza viruses, poxviruses, and 3 alphaviruses. 4
- 19. The method of claim 1, wherein steps (a) and (b) are carried out in reverse order. 1
- 20. The method of claim 1/wherein steps (a) and (b) are carried out simultaneously. 1

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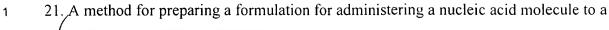
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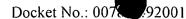
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- patient, the method comprising: 2
- (a) obtaining a solution comprising a virus that comprises a nucleic acid molecule to be 3
- administered to a patient; 4
- (b) combining the solution with an anionic polyelectrolyte; 5
- (c) combining the solution with a cationic polyelectrolyte; 6
- (d) centrifuging the solution to obtain a supernatant and a pellet, wherein the pellet 7 comprises the virus; 8
 - (e) separating the supernatant from the pellet; and
- (f) resuspending the pellet in a resuspension buffer suitable for injection into a patient to 10 prepare a formulation for administering a nucleic acid to a patient. 11
 - 22. The method of claim 21, further comprising:
 - (g) separating the virus from the polyelectrolytes.
 - 23. The method of claim 21, wherein steps (a) and (b) are carried out in reverse order.
 - 24. The method of claim 21, wherein steps (a) and (b) are carried out simultaneously.
 - 25. An assay method for detecting the presence of a virus in a sample, the method comprising:
 - (a) obtaining a sample to be assayed for the presence of a virus;
 - (b) combining the sample with an anionic polyelectrolyte; 4
 - (c) combining the sample with a cationic polyelectrolyte;
 - (d) centrifuging the sample to obtain a supernatant and a pellet, wherein the pellet 6
 - comprises the virus, if any; and 7
 - (e) assaying the pellet for the presence of the virus. 8
 - 26. The assay method of claim 25, further comprising: 1
 - (f) resuspending the pellet in a buffer solution. 2



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- 1 27. The assay method of claim 25, further comprising:
- 2 (f) separating the virus from the polyelectrolytes.
- 1 28. The method of claim 25, wherein steps (a) and (b) are carried out in reverse order.
- 1 29. The method of claim 25, wherein steps (a) and (b) are carried out simultaneously.
- 30. A kit for use in concentrating or purifying viruses, the kit comprising:
- a tube of a suitable size and shape for use in a centrifuge;
- an anionic polyelectrolyte; and
- a cationic polyelectrolyte.
 - 31. The kit of claim 30, further comprising instructions for use.
- 1 32. The kit of claim 30, wherein both polyelectrolytes are supplied in a single tube.
 - 33. The kit of claim 30, wherein the anionic polyelectrolyte and the cationic polyelectrolyte are supplied in two separate tubes.